REMARKS

Applicant is in receipt of the Office Action mailed March 29, 2004. Applicant earnestly requests reconsideration of the present case in light of the following remarks.

Claim Objections

Claims 14-18 were objected to because of an informality, specifically, the use of a semi-colon where a period is called for. Claim 14 has been amended accordingly.

Allowable Subject Matter

The Office Action objected to claims 11-13, 18, and 20, as being dependent upon a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant appreciates the allowed subject matter, but believes that the claims as currently presented are patentably distinct over the cited art.

Section 112 Rejections

Claim 21 was rejected under 35 U.S.C. 112 as lacking an antecedent basis for the limitation "said providing additional N-M candidate signals". Applicant has amended claim 21 to depend on claim 20, thereby correcting the antecedent basis error.

Claims 15 was rejected under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. More specifically, the Office Action asserts that "by providing additional N-M values for some of the initial set of candidate signals, each one of said set of candidate signals will not have N values." Applicant respectfully disagrees.

Claims 14 and 15 recite:

14. (Currently Amended) The method of claim 1, further comprising:

receiving an initial set of N candidate signals before said determining a unified signal transform from the set of candidate signals, wherein at least one of said initial set of candidate signals comprises a set of M values, wherein M is greater or less than N[[;]].

15. (Original) The method of claim 14, wherein M is less than N, the method further comprising:

providing additional N-M values for the at least one of said initial set of candidate signals, thereby generating said set of candidate signals, wherein each one of said set of candidate signals comprises N values.

Claim 14 includes the limitation that at least one of said initial set of candidate signals comprises a set of M values, wherein M is greater or less than N. Thus, M differs from N by N-M, since M + (N-M) = N.

Claim 15 represents an embodiment where M is less than N, and thus the at least one initial candidate signal, having M values, has less than N values. Applicant submits that adding an additional (N-M) values to the at least one initial candidate signal (M + (N-M)) results in the signal having N values, as claimed.

Removal of the 112 rejection of claims 21 and 15 is respectfully requested.

Section 102 Rejections

Claims 1, 3-10, 14, and 22-39 were rejected under 35 U.S.C. 102(e) as being anticipated by Hibbard (U.S. 6,249,594, "Hibbard"). Applicant respectfully disagrees.

As the Examiner is certainly aware, anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984). The identical invention must be shown in as complete detail as is contained in the claims. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1 recites:

1. (Original) A computer-implemented method for determining a "best match" of an input signal of interest from a set of candidate signals, wherein two or more of the candidate signals are uncorrelated, the method comprising:

determining a unified signal transform from the set of candidate signals;

applying the unified signal transform for at least one generalized frequency to each of the set of candidate signals to calculate a corresponding at least one generalized frequency component value for each of the set of candidate signals;

receiving the input signal of interest;

applying the unified signal transform for the at least one generalized frequency to the input signal of interest to calculate a corresponding at least one generalized frequency component value for the input signal of interest;

determining a best match between the at least one generalized frequency component value of the input signal of interest and the at least one generalized frequency component value of each of the set of candidate signals; and

outputting information indicating a best match candidate signal from the set of candidate signals.

The Office Action asserts that Hibbard teaches all of the features and limitations of claim 1. More specifically, the Office Action asserts that Hibbard (the Office Action actually referred to Hsu, but Applicant assumes that Hibbard was meant, given the statement of the 102(e) rejection and patent number) discloses a computer-implemented method for determining a "best match" of an input signal of interest from a set of candidate signals, wherein two or more of the candidate signals are uncorrelated. Applicant respectfully disagrees.

As Hibbard clearly states in col. 20, lines 49-51, Hibbard's system and method are used to generate computed contours that may be used for 2-D contouring and 3-D reconstructions. As described in col. 21 and 22 of Hibbard, Applicant further notes that Hibbard's system uses Bayesian statistics, well known in the art, applied to individual pixels at the perimeter of an incrementally growing region of interest to generate an expanding computed boundary of the region, referred to as a contour. Each successive version of the boundary or contour is parameterized, producing contour parameters p, which are then compared to an a priori defined fixed set of parameters characterizing the object boundary via an objective function (col. 23) based on the number of Fourier harmonics used in the computed contour. Applicant respectfully submits that Hibbard's

system and method are quite distinct from Applicant's invention as represented in claim 1.

As described in the present application on page 20, lines 16-29, a unified signal transform for the set of N candidate signals is determined. The unified signal transform includes a set of basis functions which describe an algebraic structure of the set of candidate signals. The unified signal transform comprises a completely new type of signal transform heretofore unknown in the prior art. This new transform converts a signal into a representation of, or comprising, generalized basis functions, wherein the basis functions represent the algebraic structure of the set of candidate signals. Stated another way, the signal transform is operable to decompose the signal into a form represented by generalized basis functions. The basis functions represent the algebraic structure of the set of signals. The unified signal transform may be used to convert a signal into a domain referred to as the "generalized frequency domain". The unified signal transform is the first and only signal transform able to project a set of uncorrelated signals into a generalize frequency domain.

As further described, the unified signal transform may be considered a superset or generalization of a plurality of existing transforms, including the Fourier transform and the Haar transform. Thus, whereas the Fourier transform may decompose a signal into frequency components of a set of sinusoidal waveforms, the unified signal transform described herein decomposes a signal into components of a set of generalized basis functions, also referred to as generalized frequency components. Where the set of signals used to generate the transform are shifted versions of each other, the generalized basis functions reduce to the sinusoidal waveforms used in Fourier analysis, i.e., the unified signal transform reduces to the standard Fourier transform. In a similar manner, when a set of N signals exhibits other particular characteristics, the generalized basis functions may reduce to the Haar, Walsh, or Hadamar transform basis functions, among others. Thus, the transform may be considered a more generalized or unifying signal transform for the set of N signals.

Applicant submits that Hibbard fails to disclose numerous of the features and limitations of claim 1. For example, Hibbard's use of an objective function based on Fourier harmonics teaches away Applicant's system, in that Hibbard nowhere teaches or

describes *determining a unified signal transform from the set of candidate signals, and applying the unified signal transform for at least one generalized frequency to each of the set of candidate signals to calculate a corresponding at least one generalized frequency component value for each of the set of candidate signals*. Nor does Hibbard teach or suggest *applying the unified signal transform for the at least one generalized frequency to the input signal of interest to calculate a corresponding at least one generalized frequency component value for the input signal of interest, and determining a best match between the at least one generalized frequency component value of the input signal of interest and the at least one generalized frequency component value of each of the set of candidate signals*. In fact, nowhere does Hibbard mention or even hint at a unified transform as disclosed in the present application. Nor does Hibbard disclose use of generalized frequency components, but rather refers to standard Fourier harmonics, as are well known in the art.

Applicant disagrees with the Examiner's apparent assertion of equality between Hibbard's MAP objective functions and Fourier Elliptic transformation, and Applicant's unified transform, and respectfully submits that one could not use Hibbard's system and method to achieve the results of Applicant's invention as claimed.

Thus, Applicant respectfully submits that claim 1 and those claims dependent therefrom are patentably distinct over Hibbard, and are thus allowable for at least the reasons provided above. Independent claims 26, 38, and 39 include similar limitations as claim 1, and so the arguments provided above apply with equal force to these claims. Applicant thus respectfully submits that claims 26, 38, and 39 and those claims respectively dependent therefrom, are patentably distinct over Hibbard, and are thus allowable for at least the reasons provided above.

Removal of the 102 rejection of claims 1, 3-10, 14, and 22-39 is earnestly requested.

Claim 42 was rejected under 35 U.S.C. 102(e) as being anticipated by Gross et al. (U.S. 6,240,372, "Gross"). Applicant respectfully disagrees.

The Office Action asserts that Gross teaches all of the features and limitations of claim 42, citing the Abstract, Figures 8A, 8B, 9A, 9B, 16A and 23A, and Columns 11-14.

However, as the Abstract clearly describes, Gross's system uses a standard frequency domain transformation, "preferably a Fourier transform" (col. 5, lines 56-57), in combination with a probabilistic method, such as a sequential probability ratio test (SPRT), which is applied at incremental times to generate a three-dimensional SPRT surface plot having variable variance level as a function of frequency and time. Nowhere does Gross teach or suggest determination and use of a unified signal transform as disclosed in the present application, nor using the unified transform to match a received telecommunications signal with one or more candidate telecommunication signals.

The Office appears to have equated any such standard frequency transform, such as a Fourier transform, with Applicant's unified signal transform. However, as argued above, the unified transform of the present application is an entirely new type of transform, and is useable to perform signal matching between the received signal and any of a set of uncorrelated signals, in stark contrast with prior art frequency domain transforms.

Applicant submits that not only does Gross not teach all of the features and limitations of Applicant's invention as represented in claim 42, but Gross's system includes numerous features and limitations that teach away from Applicant's invention as claimed, including, for example, the application of the sequential probability ratio test, and the generation of the three-dimensional SPRT surface plot (PSD vs. time vs. frequency), where PSD refers to "power spectral density". Applicant thus submits that claim 42 is patentably distinct over Gross, and is thus allowable for at least the reasons provided above. Removal of the 102 rejection of claim 42 is respectfully requested.

Claim 40 was rejected under 35 U.S.C. 102(b) as being anticipated by Nakajima et al. (U.S. 5,915,034, "Nakajima"). Applicant respectfully disagrees.

Again, the Examiner has apparently attempted to equate Nakajima's two-dimensional Fourier transform with Applicant's unified signal transform. Applicant submits that even a cursory reading of Nakajima and the present application clearly distinguishes between the two. In asserting that Nakajima teaches determining a unified signal transform from the set of candidate signals, the Office Action cites Figure 4, Step S408. Applicant notes that the cited passage reads, "After amplitude suppressing

processing is performed in step S407, the controller 20-1 sends the synthesized Fourier image data subjected to amplitude suppressing processing to the Fourier transform unit serving as an image processing means to perform second-time two-dimensional DFT." Applicant submits that two-dimensional Fourier transforms are well known in the art, while Applicant's unified signal transform is not described in the prior art at all. Applicant submits that Nakajima's system, which consists primarily of filtering the image data, then using two-dimensional Fourier transforms on a registration image and a candidate image and synthesizing the two to generate synthesized Fourier image data, applying the two-dimensional Fourier transform again, this time to the synthesized image data, and collating the registration pattern with the collation pattern on the basis of the intensities of the correlation components of pixels in a correlation component area set in the second synthesized Fourier image data. Phase information may then be extracted using amplitude suppression on one or more of the image data sets. (Abstract)

Nowhere does Nakajima teach or suggest the features and limitations of Applicant's invention as represented in claim 40, specifically, the determination and use of a unified signal transform as disclosed in the present application.

Applicant thus submits that claim 40 is patentably distinct over Nakajima, and is thus allowable for at least the reasons provided above. Removal of the 102 rejection of claim 40 is respectfully requested.

Claim 41 was rejected under 35 U.S.C. 102(b) as being anticipated by Nishiya et al. (U.S. 5,109,431, "Nakajima"). Applicant respectfully disagrees.

In asserting that Nishiya teaches determining a unified signal transform from a set of waveforms, the Office Action cites Figures 1, 2, and 3c, as well as column 2, lines 51-68 and column 3, lines 1-8. However, the cited portions of Nishiya disclose a system wherein a received waveform or input pattern is approximated with a broken line, e.g., a series of line segments or sequence of vectors, which is compared to standard pattern, also a broken line or sequence of vectors. In other words, the two broken lines or vector sequences are compared, instead of waveforms that include many more data points.

Clearly, Nishiya does not teach the determination and use of a unified signal transform as disclosed in the present application and represented in claim 41. For

example, nowhere does Nishiya teach or suggest *determining a unified signal transform from the set of candidate stock behavior waveforms*, nor *applying the unified signal transform for at least one generalized frequency to each of the set of candidate stock behavior waveforms to calculate a corresponding at least one generalized frequency component value for each of the set of candidate stock behavior waveforms*. Neither does Nishiya disclose *applying the unified signal transform for the at least one generalized frequency to the input stock history waveform of interest to calculate a corresponding at least one generalized frequency component value for the input stock history waveform of interest*, nor *determining a best match between the at least one component value of the input stock history waveform of interest and the at least one component value of each of the set of candidate stock behavior waveform*. In fact, Nishiya does not mention or even hint at a unified signal transform as disclosed in the present application, nor does Nishiya disclose or hint at a generalized frequency domain.

Thus, Applicant submits that Nishiya neither teaches nor suggests the features and limitations of Applicant's invention as represented in claim 41, and so Applicant respectfully submits that claim 41 is patentably distinct over Nishiya, and is thus allowable for at least the reasons provided above. Removal of the 102 rejection of claim 41 is respectfully requested.

Section 103 Rejections

The Office Action rejected claims 2, 22-25, 36, and 37 under 35 U.S.C. 103(a) as being unpatentable over Hibbard. Applicant submits that since independent claims 1 and 26 have been shown to be patentably distinct over Hibbard, respective dependent claims 2 and 22-25, and 36-37 are similarly patentably distinct over Hibbard, and are thus allowable for at least the reasons provided above.

Removal of the 103 rejection of claims 2, 22-25, 36, and 37 is respectfully requested.

Applicant also asserts that numerous ones of the dependent claims recite further distinctions over the cited art. However, since the independent claims have been shown

to be patentably distinct, a further discussion of the dependent claims is not necessary at this time.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 50-1505/5150-51800/JCH.

Also enclosed herewith are the following items:

☒ Return Receipt Postcard

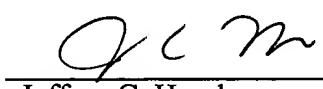
☐ Request for Approval of Drawing Changes

☒ Notice of Change of Address

☐ Check in the amount of $ for fees ( ).

☐ Other:

Respectfully submitted,



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